A Parametric Modelling Tool For High Speed Displacement Monohulls

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In ship design projects, it is of utmost importance to investigate a wide range of options during the concept design phase in order to determine which best suits to the requirements. Although, keeping the concept design phase shorter in order to be competitive in the market is as important. The chances for a shipyard to be awarded with a contract would surely increase with the number of its design alternatives with detailed evaluations. However, the number of the design alternatives is inversely proportional to the time span of concept design for each alternative. The detailed evaluations at this stage can only be performed with CFD (Computational Fluid Dynamics) and FE (Finite Element) tools, and both require a complete representation of the ship hull geometry. So, only having a faster hull form generation tool would enable the designer to evaluate more options.

It is possible to achieve rapid geometry generation through fully parametric modeling. Fully parametric hull modeling is the practice of creating the entire hull shape definition only from form parameters, without the need for offset data or predefined lines plan. In this thesis a fully parametric modeling tool, PHull, is developed using Java programming language for rapid geometry generation of high speed displacement monohulls, in order to be used in hydrodynamic optimization process. The results from the validation cases, FFG-7 and ATHENA Model 5365, are presented.

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